



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/810,729

03/29/2004

Tomoaki Toda

119312

9667

25944

7590

03/29/2007

OLIFF & BERRIDGE, PLC

P.O. BOX 19928

ALEXANDRIA, VA 22320

EXAMINER

SAYADIAN, HRAYR

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

03/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

**Advisory Action  
Before the Filing of an Appeal Brief**

Application No.

10/810,729

Applicant(s)

TODA, TOMOAKI

Examiner

Hrayr A. Sayadian

Art Unit

2828

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 05 March 2007 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☐ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires Four months from the mailing date of the final rejection.  
b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**NOTICE OF APPEAL**

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

**AMENDMENTS**

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);  
(b) ☐ They raise the issue of new matter (see NOTE below);  
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
5. ☒ Applicant's reply has overcome the following rejection(s): NONE.  
6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
The status of the claim(s) is (or will be) as follows:  
Claim(s) allowed: \_\_\_\_\_.  
Claim(s) objected to: \_\_\_\_\_.  
Claim(s) rejected: 1-5, 11-13, 15, 16, 19 and 25-30.  
Claim(s) withdrawn from consideration: \_\_\_\_\_.

**AFFIDAVIT OR OTHER EVIDENCE**

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

**REQUEST FOR RECONSIDERATION/OTHER**

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
Please see the attached explanation.  
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_.  
13. ☐ Other: \_\_\_\_\_.

**MINSUN OH HARVEY  
PRIMARY EXAMINER**

### **EXPLANATION OF ADVISORY ACTION**

1. The amendment to claim 28 is entered, and its rejection under 35 U.S.C. § 112(2) as lacking antecedent basis for "said III-V group semiconductor" is hereby withdrawn.
2. The remaining objections and rejections in the Final Office Action dated 11/3/2006 are maintained.

### **Response to Applicant's Argument(s)**

3. Applicant's arguments have been fully considered, but are found to overcome neither the objections/rejections to the claims under 35 U.S.C. §§132(a) and 112(2), nor the rejections over the applied prior art.

At the outset, Examiner notes that the New Matter objection/rejections are in response to Applicant's amendment and arguments filed 8/9/1986.

Applicant's argument that Applicant is entitled to be one's own lexicographer is a truism cloaking a change in Applicant's position on the meaning and the scope of "the ... transistor" recited (expressly or by argument, or both) in the claims. Applicant therefore effectively is amending the claims.

At issue is whether Applicant recites "the transistor" as an abbreviation because Applicant is acting as one's own lexicographer and using "transistor" to avoid repeating a long recitation (as now argued; see, for example, pages 8-9 of the After Final Request for Reconsideration filed 3/5/2007). Contrary to Applicant's present argument, the prosecution history shows that "transistor" was not introduced to avoid repeating a long recitation.

Applicant previously asserted and argued that "the ... transistor" recited in amended claims distinguishes over the applied prior art. See, for example, page 8 of the 8/9/2006 amendment stating "[f]urthermore, in the laser of the claimed invention, an NPN structure and a PNP structure are included in a single NPNP structure/element and are operated to inject holes and electrons into an active layer, respectively."). By this amendment, assertion, and argument,

Applicant expressly presented in the 8/9/2006 Response that the "the transistor" is a substantive feature of the claims. Applicant's 8/9/2006 Response accordingly brought on the New Matter and 112(2) objection/rejections. Applicant's present argument therefore expressly contradicts Applicant's previous argument. And the present argument that "the ... transistor" is used as a short-hand reference to a long recitation therefore is found non-convincing.

Applicant cites paragraphs [0015] and [0027] of this Application as originally filed (corresponding to paragraphs [0017] and [0035] of USPGPUB 2004/0196881 of this Application, to which all references hereinafter will be made), which are duplicates of each other, and submits that the claims amended on 8/9/2006 do not present new matter with regard to "controlling to adjust" and "adjusting ... by controlling," as pointed out by the 11/3/2006 Final Office Action.

In response, Examiner notes that paragraph [0017] recites:

If the first semiconductor layer group and the second semiconductor layer group are controlled appropriately to adjust the amount of the electrons and the holes to be injected into the active layer, the excitation in the active layer can be controlled. In this case, the intensity modulation of light from the semiconductor laser can be realized.

Examiner also notes that claim 1 now recite:

and wherein the successively formed n-type emitter layer, the p-type base layer, the active layer, and the n-type base layer constitute a first semiconductor layer group which functions as a first bipolar transistor, and the first bipolar transistor is controlled to adjust an amount of electrons to be injected into the active layer,

and wherein the successively formed p-type base layer, the active layer, the n-type base layer and the p-type emitter layer constitute a second semiconductor layer group which functions as a second bipolar transistor, and the second bipolar

transistor is controlled to adjust an amount of holes to be injected into the active layer,

and wherein by controlling at least one of said amount of electrons and said amount of holes to be injected into said active layer, an intensity of light generated and oscillated is modulated.

And Examiner notes that original claims 8-10, now cancelled, recited:

8. The semiconductor laser as defined in claim 1, wherein said n-type emitter layer, said p-type base layer, said active layer and said n-type base layer, which are successively formed, constitute a first semiconductor layer group functioning a bipolar transistor, and by driving said first semiconductor layer group, an amount of electrons to be injected into said active layer is controlled.

9. The semiconductor laser as defined in claim 8, wherein said p-type base layer, said active layer, said n-type base layer and said p-type emitter layer, which are successively formed, constitute a second semiconductor layer group functioning a bipolar transistor, and by driving said second semiconductor layer group, an amount of holes to be injected into said active layer is controlled.

10. The semiconductor laser as defined in claim 9, wherein by controlling at least one of said amount of electrons and said amount of holes to be injected into said active layer, an intensity of said light generated and oscillated is modulated.

Examiner notes that Claim 1 now recites "the first (or second) transistor is controlled to adjust ...," whereas paragraph [0017] of the specification discloses the "first semiconductor layer group and the second semiconductor layer group are controlled appropriately to adjust ...". Surely Applicant would recognize that a "layer group ... controlling to adjust ..." neither is the same as, nor has the same scope of, a "transistor ... controll[ing] to adjust ...". Nor does amended claim 1 find support in now cancelled claims 8-10.

Since the recitation "the ... transistor is controlled to adjust ..." lacks support in the specification as filed, amended claim 1 reciting these features presents new matter. Claim 1 and the claims depending therefrom therefore are objected to under 35 U.S.C. §§132(a) and 112(1). Moreover, since Applicant argued in the 8/9/2006 response that "transistor" is a substantive recitation limiting the amended claims and distinguishing them over the prior, the 112(2) rejections are proper because the recitations "the ... transistor" lack antecedent bases.

Applicant also points to paragraph [0028] of the specification and argues that it supports the "constituting ..." steps. In response, Examiner notes that the recitations "constituting ..." in independent claim 16, and the claims depending therefrom, include the recitation "the ... transistor." And Examiner notes that paragraph [0028] fails to support the two "constituting ..." steps.

As to art rejection, alleging various methods of operation, Applicant argues that the claims distinguish over Ogura.

In response, Examiner notes that claims 1-5, 11-13, and 15 are device claims. And since the devices Ogura discloses have all of the structural recitations limiting claims 1-5, 11-13, and 15, Ogura's disclosed devices anticipate these claims. Any recited function of the structural limitations recited in the claims can be performed by their counterpart structures disclosed in Ogura's devices.

Applicant's point to Ogura, "column 3, lines 14-26" and contend that "Ogura teaches a thyristor." See, first and second sentences of the paragraph starting at the bottom of page 9 of Applicant's present response. Applicant therefore submits that Ogura therefore fails anticipate claims 1-5, 11-13, and 15.

Contrary to this contention however the pointed to disclosure in Ogura instead discloses that "[a]n element of the pnpn structure exhibits the characteristics of a thyristor when a forward voltage is applied to the p and n electrodes on the opposite ends of the semiconductor element. See, Ogura, column 3, lines 14-18. And, indeed, one of

ordinary skill in the art reading the present Application and considering claims 1-5, 11-13, and 15 would recognize that element of the devices of claims 1-5, 11-13, and 15 would function as a thyristor and therefore have the characteristics of a thyristor "when a forward voltage is applied to the p and n electrodes on the opposite ends of the semiconductor element" of the devices in claims 1-5, 11-13, and 15.

As to claims 16, 19, and 25-30, directed to a method of oscillating a semiconductor laser, Applicant recognizes that the devices disclosed by Ogura is turned on and off, but contends that it is turned on and off by three electrodes. Applicant also contends that Ogura fails to disclose "controlling the amount of holes or electrons." And recognizing that Ogura discloses the devices being connected to four electrodes and recognizing that the "[f]our electrodes could forcibly be used in Ogura to simultaneously turn on and off the laser," Applicant now contends that Ogura fails to "even conceive such a technique."

In response, Examiner notes that none of claims 16, 19, and 25-30 require four as opposed to three electrodes, let alone all four being used "simultaneously." Both FIGs. 3 and 4 in Ogura disclose the devices being used as recited in the method claims 16, 19, and 25-30. Moreover, contrary to Applicant's contention, Ogura discloses "controlling the amount of holes or electrons" by virtue of the turning on and off of the disclosed devices, which Applicant recognizes Ogura discloses.

Lastly, recognizing that Ogura discloses GaAs layer allowing traveling electrons, Applicant contends that "[I]t is virtually impossible for a thyristor laser to apply an electric field strong enough to cause a Gunn-effect [since the current in the on state should be restrained not to severely impact the element]." In response, Examiner notes that Applicant's "severely impact[ing]" argument is an argument directed to undesirability (and therefore possibility) of applying a high electric field rather than an argument directed to an impossibility of applying a high electric field. Applicant's argument therefore implicitly recognizes that a high electric field can be applied, albeit undesirably, which has no effect on the anticipation rejection.

Moreover, Examiner again notes that Ogura discloses a pnpn structure having an element having thyristor characteristic. The devices Ogura discloses has the same material composition and structural arrangement recited in method claims 29 and 30. And claims 29 and 30 do not recite applying an electric field high enough to cause a Gunn-effect. Rather these claims recite the ability to allow the Gunn-effect (note the recitation "whereby a current oscillation due to Gunn-effect ... achieves modulation of ... intensity ... of light generated and oscillated CAN BE modulated at high speed," recited in claim 29. And the GaAs material forming the devices disclosed by Ogura allows the Gunn effect. Examiner moreover notes that claims 29 and 30 do not require forward bias (thus low applied voltage) and ON state to generate "light." As Applicant recognizes, the Ogura disclosed devices can be both forward and reversed biased. And it is notoriously well known in the semiconductor art that pn junctions generate light when either biased forward or biased reverse (for example, thus allowing lasing light emitting action or non-lasing light emitting action, respectively).

With respect to amended claim 28, Examiner notes that it now tracks claim 12 and similarly rejected over Ogura for purposes of appeal.